

Attorney's Docket:
064493.0111

Patent Application:
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Remarks

Applicant has carefully reviewed the Application in light of the Official Action mailed December 22, 1999. In order to advance prosecution of this Application, Applicant has amended Claims 1-4, 6, 8-13, 15, 18-20, 23, 25-26, 28, and 33 in order to clarify the invention. Applicant makes no admission that these amendments were made in response to prior art.

Applicant submits that the claims in their current form are allowable over the Examiner's rejections. Thus, Applicant respectfully requests reconsideration and favorable action in this case.

Section 102 Rejections

The Examiner rejects Claims 1-4, 9-13, and 18-24 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,532,544 issued to Federau ("*Federau*"). (Detailed Action ¶ 3). In addition, the Examiner rejects Claim 33 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 5,652,617 issued to Barbour ("*Barbour*"). (Detailed Action ¶ 4). Applicant, however, disagrees with the Examiner's rejections.

To anticipate a claim, a single prior art reference must teach each and every element as forth in the claim. M.P.E.P. § 2131. Thus, if the prior art reference fails to teach at least one element as set forth in the claim, the reference cannot anticipate the claim. Applicant submits that *Federau* does not teach each and every element in any of Claims 1-4, 9-13, and 18-24 and that *Barbour* does not teach each and every element in

Claim 33 and, hence, that these claims are allowable over *Federau* and *Barbour*.

Federau teaches using a television camera for imaging the side of a bore hole. (Col. 3, lines 44-47; Figure 1). The camera has an optical imaging system 11 that transfers an image of an angular section of a particular length of the side of the bore hole onto a line sensor 23. (Col. 3, line 56 - col. 4, line 3). Line sensor 23 detects the transferred image. (Col. 4, lines 2-13). The camera can be rotated about the longitudinal axis 7 of the bore hole, which is aligned with the panoramic axis 1 of the camera, to produce a 360° image of the particular length of the side of the bore hole. (Id.). In addition, the camera can be lowered further into the bore hole to image another particular length of the side of the bore hole. (Col. 3, lines 6-10). Note, however, that the camera in *Federau* does not have two image sensors; it simply rotates the camera, to which the image sensor is attached, 360° to image a particular length of the side of the bore hole.

Applicant's invention as recited in Claim 1, however, as amended, includes "**a first image sensor** operable to acquire an image in a first direction along a first axis" and "**a second image sensor** operable to acquire an image in a second direction essentially perpendicular to the first direction." Nowhere does *Federau* teach such a configuration. Note, the Examiner cites the same portion of *Federau* - "(col. 4, lines 2-13)" - as teaching both elements. But this portion only teaches one sensor - line sensor 23, rendering the rejection insufficient because "a first image sensor" and "a second image sensor" are

not taught. For at least this reason, Applicant respectfully requests the Examiner to withdraw the § 102 rejection of Claim 1 and its dependents.

Claims 2-4 and 9-13 depend from Claim 1, already shown to be allowable over *Federau*, and contain additional elements not taught by *Federau*. For example, Claim 2, as amended, specifies that "the second image sensor is an array of image sensors operable to simultaneously acquire an image 360 degrees around the first axis." Nowhere, however, does *Federau* teach such an image sensor because line sensor 23 must be rotated to image 360° of a particular length of the side of the bore hole. As another example, although Claim 4, as amended, specifies that "the first axis is parallel to the long axis of the pipeline," the camera in *Federau* only acquires images of the side of the bore hole, not in a direction along the long axis of a pipe. As a further example, Claim 10, as amended, specifies that "the first image sensor and the second image sensor are a single image sensor ... mounted in a rotatable housing, the single image sensor operable to acquire an image in a first direction along the first axis ..., the single image sensor operable to acquire an image zero to ninety degrees offset from the first direction due to a rotation of the rotatable housing, the first axis parallel to the long axis of the object being inspected." Nowhere, however, does *Federau* teach such a sensor because its line sensor 23 only detects images perpendicular to the long axis of the object being inspected. For at least these reasons, and for the reasons given with respect to Claim 1, Applicant submits that Claims 2-4 and 9-13 are patentably distinguishable

over *Federau* and, hence, respectfully requests that the Examiner withdraw the § 102 rejection of these claims.

Claim 18, the second independent claim, also contains elements that *Barbour* does not teach. Claim 18, as amended, recites "an image sensor ... operable to capture an image in a first direction parallel to the direction of travel of the housing, the image sensor further operable to capture an image in a second direction, the second direction approximately perpendicular to the first direction." Nowhere, however, does *Federau* teach such an image sensor because line sensor 23 only detects images perpendicular to the direction of travel. For at least this reason, Applicant respectfully requests the Examiner to withdraw the § 102 rejection of Claim 18 and its dependents.

Claims 19-24 depend from Claim 18, already shown to be allowable over *Federau*, and contain additional elements that *Federau* does not teach. For example, Claim 19, as amended, specifies that "the housing is rotatable and operable to rotate from the first direction to the second direction and operable to rotate around the first axis." The housing in *Federau*, however, cannot be so manipulated; it only rotates about longitudinal axis 7. As another example, Claim 22 recites "a series of image sensors spaced about the housing and operable to capture an image about the first axis **without rotating the housing.**" *Federau*, however, does not teach such an arrangement. For at least these reasons, Applicant submits that *Federau* does not teach all of the limitations of Claims 19-24 and, hence, respectfully requests the Examiner to withdraw the § 102 rejection of these claims.

Barbour teaches an apparatus for visually examining the side walls of a bore hole. (Abstract). The apparatus includes a down hole video tool 8 that has a video camera 52 positioned at its tip and a rotatable side camera 200 mounted inboard from video camera 52. (Abstract; col. 7, line 57 - col. 8, line 15; Figure 1).

Claim 33, however, which is another independent claim, contains elements that *Barbour* does not teach. For example, Claim 33, as amended, recites "a stepper motor coupled to the end of the upper section" and "a lower section coupled to the upper section and the stepper motor ..., the lower section further comprising an upper part having a high torque dc motor." *Barbour*, however, only teaches a DC motor to turn rotary driver 300. (Col. 10, line 22-23). Hence, there is no teaching of either "a stepper motor coupled to the end of the upper section" or "an upper part having a high torque dc motor," much less both. As a further example, Claim 33 recites "a lower part coupled to the upper part by a pivoting means, the pivoting means driven by the high torque motor and operable to pivot the lower part from a down view to a side view, the lower part further comprising an image sensor coupled to the camera card and operable to acquire an image in a down position and a side position and any position in between." Nowhere, however, does *Barbour* teach a "pivoting means ... operable to pivot the lower part from a down view to a side view" or "an image sensor ... operable to acquire an image in a down position and a side position and any position in between;" neither video camera 52 nor side camera 200 pivots "from a down view to a side view."

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For at least these reasons, Applicant submits that Claim 33 contains elements that *Barbour* does not teach, thus, respectfully requests the Examiner to withdraw the § 102 rejection of Claim 33.

Section 103 Rejections

The Examiner rejects Claims 5-8, 14-17, 25-28, and 29-32 under 35 U.S.C. § 103(a) as being unpatentable over *Federau* in view of *Barbour* and U.S. Patent No. 5,528,453 issued to Berman, et al. ("*Berman*"). (Detailed Action ¶ 6). Applicant, however, disagrees with the Examiner's rejections.

In order to establish a case of prima facie obviousness for a claim, the combined prior art references must teach or suggest all the limitations of the claim. M.P.E.P. § 2142. Thus, if the combination of references does not teach or suggest at least one limitation, the combination does not render the claim obvious. Applicant submits that the combination of *Federau*, *Barbour*, and *Berman* fails to teach or suggest every limitation in any of the claims and, hence, that the claims are patentably distinguishable over these references.

Claims 5-8 and 14-17 depend from Claim 1, already shown to be allowable over *Federau*, and contain limitations that none of *Federau*, *Barbour*, or *Berman* teaches or suggests. For example, Claim 6, as amended, specifies that "the coaxial cable includes a quick disconnect to allow easy removal and installation of other camera assemblies or tools." Nowhere, however, does *Federau*, *Barbour*, or *Berman* teach or suggest such a coaxial cable. As another example, Claim 8, as amended, specifies that

"the coaxial cable passes over a cable arm encoder operable to determine the depth of the camera and display it on the monitor with the output of the camera board and processor." Nowhere, however, does *Federau*, *Barbour*, or *Berman* teach or suggest such a configuration. Note, the Examiner's citation of *Federau* for this teaching - "(See *Federau* col. 4, lines 58-68)" - only teaches an angle encoder used to determine the orientation of the camera relative to longitudinal axis 7 of the bore hole. For at least these reasons, and for the reasons given with respect to Claim 1, Applicant submits that Claims 5-8 and 14-17 are patentably distinguishable over the combination of *Federau*, *Barbour*, and *Berman* and, hence, respectfully requests the Examiner to withdraw the § 103 rejection of these claims.

Claims 25-28 depend from Claim 18, already shown to be allowable over *Federau*, and contain limitations that none of *Federau*, *Barbour*, or *Berman* teaches or suggests. For example, Claim 26, as amended, specifies that "the coaxial cable includes a quick disconnect to allow easy removal and installation of other camera assemblies or tools." As mentioned previously with respect to Claim 6, however, nowhere does *Federau*, *Barbour*, or *Berman* teach or suggest such a coaxial cable. As another example, Claim 28, as amended, specifies that "the coaxial cable passes over a cable arm encoder operable to determine the distance that the camera has traveled and display it on the monitor with the output of the camera board and processor." As discussed previously with respect to Claim 8, however, nowhere does *Federau*, *Barbour*, or *Berman* teach or suggest such a configuration. For at least these reasons, and for the reasons

given with respect to Claim 18, Applicant submits that Claims 25-28 are patentably distinguishable over the combination of *Federau*, *Barbour*, and *Berman* and, hence, respectfully requests the Examiner to withdraw the § 103 rejection of these claims.

Claim 29 is an independent claim containing limitations that none of *Federau*, *Barbour*, or *Berman* teaches or suggests. For example, Claim 29 recites "a cable arm supported by an adjustable leg, the cable arm attached to the carrying case, the cable arm operable to have the coaxial cable pass over it." Nowhere, however, does *Federau*, *Barbour*, or *Berman* teach or suggest such a cable arm. In addition, Claim 29 recites "a camera assembly ... having a single camera operable to capture an image in a first direction along a long axis and capture an image in a second direction, the second direction ninety degrees offset from the first direction." However, *Federau* only has a camera that can acquire an image of the side of the bore hole, and *Barbour* only has one camera for viewing down the bore hole and one camera for viewing the side of the bore hole, not one camera that can acquire an image "along a long axis and capture an image in a second direction, the second direction ninety degrees offset from the first direction." For at least these reasons, Claim 29 is patentably distinguishable over the combination of *Federau*, *Barbour*, and *Berman* and, thus, Applicant respectfully requests the Examiner to withdraw the § 103 rejection of Claim 29.

Claims 30-32 depend from Claim 28, already shown to be allowable over the combination of *Federau*, *Barbour*, and *Berman*, and contain additional limitations that none of *Federau*,

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Barbour, or *Berman* teaches or suggests. For example, Claim 31 specifies that "the coaxial cable includes a quick disconnect near the camera assembly," but as mentioned with respect to Claim 6, none of *Federau*, *Barbour*, or *Berman* teaches or suggests such a coaxial cable. In addition, Claim 32 recites "a cable arm encoder operable to measure the length of cable to determine the distance the camera assembly has traveled," but as discussed with respect to Claim 8, none of *Federau*, *Barbour*, or *Berman* teaches or suggests such an encoder. For at least these reasons, and for the reasons given with respect to Claim 29, Applicant submits that Claims 30-32 are patentably distinguishable over the combination of *Federau*, *Barbour*, and *Berman* and, thus, respectfully requests the Examiner to withdraw the § 103 rejection of these claims.

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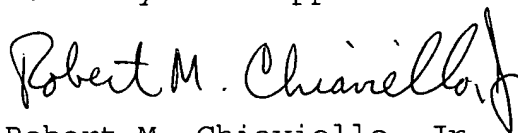
Conclusions

Applicant has now made an earnest attempt to place this Application in condition for allowance. For the foregoing reasons, and for other reasons clearly apparent, Applicant respectfully requests full allowance of all pending claims. If the Examiner feels that a telephone conference or an interview would advance prosecution of this Application in any manner, the undersigned attorney for Applicant stands ready to conduct such a conference at the convenience of the Examiner.

Although no fees are believed to be due at this time, the Commissioner is hereby authorized to charge any fees or credit any overpayments to Deposit Account No. 02-0384 of Baker Botts L.L.P.

Respectfully submitted,

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